524,403

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization

International Bureau



(43) International Publication Date 26 February 2004 (26.02.2004)

PCT

(10) International Publication Number WO 2004/017134 A1

(51) International Patent Classification⁷: G09G 3/19

G02F 1/15,

(21) International Application Number:

PCT/IB2003/003030

(22) International Filing Date:

1 July 2003 (01.07.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 02078378.3

15 August 2002 (15.08.2002) EP

- (71) Applicant (for all designated States except US): KONIN-KLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): JAGT, Hendrik, J., B. [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). WILLARD, Nicolaas, P. [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). JOHNSON, Mark, T. [GB/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (74) Agent: VAN DEN HOOVEN, Jan; Internationaal Octrooibureau B.V., Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

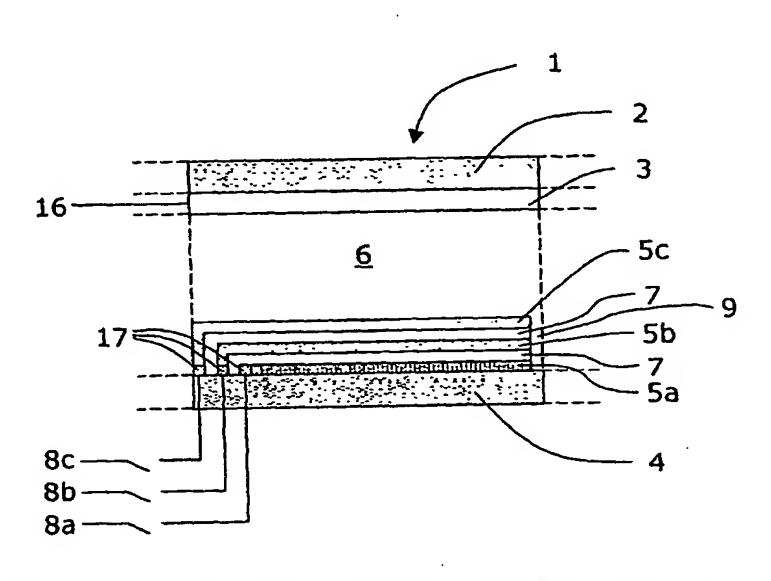
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, F1, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG,

[Continued on next page]

(54) Title: FULL-COLOR ELECTROCHROMIC DISPLAY WITH STACKED IN CELL MONOCHROMIC ELECTROCHROMES



(57) Abstract: A display device comprising a plurality of independently addressable pixels (1) comprising: a first substrate (2); a counter-electrode (3); a second substrate (4); a stack of electrochromic layers (5a, 5b, 5c) associated with said second substrate (4); an electrolyte (6) disposed between said counter-electrode (3) and said stack of electrochromic layers (5a, 5b, 5c). Said electrochromic layers (5a, 5b, 5c) are each independently addressable for switching operation; and separated from each other by layers of an electrolyte (7). A driving method for operating said pixel (1) comprises the steps of: providing at least one power line (8) which is selectively connectable to an electrochromic layer (5) or a working electrode (10) associated with said electrochromic layer (5); selectively applying to said power line

(8) a bleaching or coloring voltage; addressing the electrochromic layer (5) which is to be bleached or colored; connecting said power line (8) to said addressed electrochromic layer (5); retaining the connection of said power line (8) during a hold period; and disconnecting said power line (8).

2004/017134 A1